Service Manual

for seca 374 / 375 / 376 CN

Variants:
3741321009
3741321369
3757021009
3767021004
3767021009
3767021094
3767021099
3767021159
3767021249

Service Manual Number:
17-05-01-329-b
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Description:
electronic babyscale multi load cell design, DMS low end module, LCD, for battery use, prepared for mains operation.

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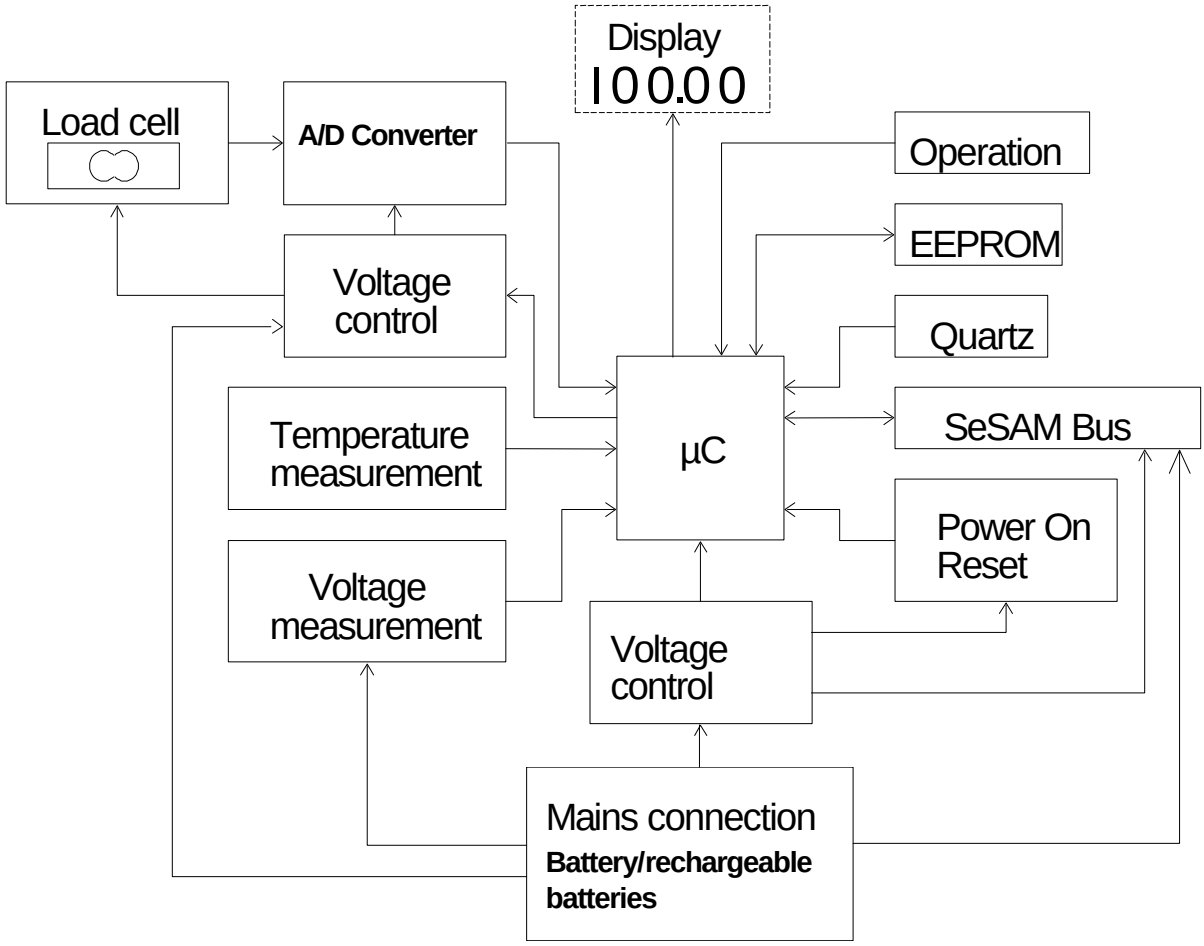
Brief description of the DMS module

Introduction

The DMS modules are used to determine weights using a load cell with strain gauges. The DMS low end module also accommodates the display and the operating unit. To allow the modules to be adapted to different scales, an EEPROM is integrated which is used to configure the module. A connection to the SeSAM bus (Seca's Serial Autoconfiguring Multicontroller bus) is provided via which the scale can be calibrated and additional modules can be connected.



Weight measurement

The DMS modules use load cells with strain gauges in a double bridge circuit as sensors.
The entire analog part runs on its own supply voltage. This voltage can be switched by the µC to 3V, 5V or 10V. This voltage is also supplied to the load cells. At full load, they deliver a bridge output voltage of 2mV/V.
This voltage is measured by a dual slope a/d converter. The DMS ext module can evaluate up to four load cells which are multiplexed accordingly. Only one load cell can be connected to the other types of DMS modules.
The conversion time is selected so that a new measured value is available every 0.1 s.
The resolution of the a/d converter is 0.05 µV/V. If several load cells are connected, keep in mind that the resolution relates to the mean output signal of all the load cells connected.
When these measured values are within the expected range, they are converted into a weight value using a third order polynomial. In order to increase accuracy, eight measured values are used to calculate the weight to be displayed.
The first value obtained after switch-on is used as the zero point. If the values obtained later on do not deviate strongly from this value, the zero point is corrected in order to compensate for possible drifts. (Please also refer to temperature measurement.)

Display (only DMS low-end module and SLC highend)

Whenever eight new measured values are available, i.e. approx. every 0.8 s, the weight is displayed. The display is an LCD which is controlled by duplex operation. A maximum of five digits as well as a few special characters can be displayed.

Explanation of the special characters:

- The battery symbol is used to alert of the fact that the battery is going flat.
- Hold indicates that the weight display has frozen.
- Tare or Net indicate that a weight on the scale has been tared off.
- The left arrow indicates if additional explanations are given next to the display.
- The weight units on the right show the unit in which the measured weight is displayed.

Temperature measurement

In order to compensate for the load cell's temperature drift, the temperature is measured regularly and the measured value is adjusted accordingly.

To perform this measurement, a capacitor is charged every 2 seconds alternately via a reference resistor and an NTC with a linearization resistor connected in parallel. The time until the capacitor has reached a specific voltage is measured. The temperature is calculated from the ratio of the two times.

To reduce measured value fluctuations, a mean value of 16 temperature values is always formed. The fluctuation then amounts to approx ±0.2°C.

The difference between the current temperature and the temperature measured when the last zero point was obtained is used to determine a projected zero point. To do so, one assumes that the weight change per °C is constant. The weight value is then corrected in accordance with the zero point calculated and in accordance with the difference to the temperature measured when the scale was calibrated. A linear and a square term are used for this purpose.

Power supply

Power supply is provided by AA size batteries (batteries or rechargeable batteries) and a plug-in power supply unit. The batteries pass the voltage via reverse voltage protection diodes to a 3V in-phase regulator. A coil which suppresses interference and a buffer capacitor come next. This 3 V supply voltage is supplied to the digital part of the circuit.

Another in-phase regulator generates the voltage for the analog part. The µC can set this regulator to 3V, 5V or 10V.

In order to operate the module on rechargeable batteries a recharging circuit can be connected. This circuit charges the rechargeable batteries at a constant current when a power supply unit is connected.

When the supply voltage is applied, a power-on reset is initiated at the µC via an RC element.

To monitor the condition of the batteries, their voltage is measured every 2s. For this purpose, a 2.2 V reference voltage is integrated upwards and the time until the voltage has reached approx. 9% of the supply voltage is measured. Afterwards, a downwards integration is made from 2.2V to the threshold. From these two results, a measured value for the voltage is calculated. If the voltage drops below a certain limit, the user is alerted by the battery symbol in the LCD. If the next threshold is undershot, „bAtt" is displayed and weighing is no longer possible.

Operation (only DMS low-end module and SLC highend, with the exception of vibration-sensitive switch and platform switch)

Four buttons are provided; one is used to switch the module on and off, the others can be programmed as required. These three buttons can be pressed just lightly or longer (longer than 1.5s), so that six events are available. The actions tare, hold and unit switch-over can be assigned to them.

If you press another button when switching on the scale, the scale will switch to the calibration counter and recalibration mode.

Instead of the normal start button a piezo diaphragm can be soldered to the PI connection. If the piezo diaphragm registers a vibration, a transistor switches and generates an interrupt signal which causes the µC to start.

If the start button is directly connected to this interrupt input, a button is obtained which is only active when the scale is switched off. It can be fitted under the platform, for instance, so that the scale is started by briefly stepping on it.

Programming

The DMS modules are equipped with an EEPROM which is controlled via the I²C bus protocol. On this EEPROM all parameters are stored that can be used to influence the program sequence. For example the way the weight is displayed or the allocation of buttons. It also stores the coefficients for determining the weight and data for temperature compensation, e.g. the factors for the polynomial.
Furthermore, the scale can store values to be retrieved when the scale is switched on the next time, e.g. the weight unit used last.
In order to avoid errors, the EEPROM contents are divided into blocks which are monitored by cyclic redundancy checks. The hamming distance is 4 so that single errors can be corrected and double errors are certainly detected. In addition, values which are recalculated when the scale is in operation can be replaced by default values if an error is detected that cannot be remedied.

Serial bus

To allow the scale to be calibrated and additional modules, such as additional displays, to be connected, the DMS modules are equipped with an interface to the SeSAM bus.
On this bus the stabilized and non-stabilized supply voltages are available. Via a data and a clock pulse line all relevant data is transmitted to other modules. A special start line is provided via which the scale can be switched on or other modules can signal that they want to send data.
Both data and start line are open collectors so that they can be switched to low by all modules.
For further details on the bus, please refer to the relevant documentation.

Fault handling

If faults occur, the SeSAM bus initiates a fault message with the relevant fault code. Furthermore, each fault message includes the number of the module type on which the fault has occurred and a code which indicates how long the message is to stay on display and which displays are to be suppressed.
The DMS low end module displays its own fault messages on its LCD. Module type (0 for the low-end module) and fault number are displayed. The other DMS modules only transfer fault messages to the bus (module type = 1).
The following fault messages are implemented:

10	20 bit counter overflow
11	Counts out off range
12	Switch-on zero setting out off range
13	Zero tracking out off range
14	Error in the kg value calculation
15	Recalibration error
bAtt	Battery voltage too low
21	Error in battery voltage measurement
22	Error in temperature measurement
tEMP	Temperature range exceeded (< 0°C or > 50°C)
30	General bus error
32	Command buffer full
33	More than 8 slaves detected
40	EEPROM error
41	Incorrect EEPROM access
50	Rom checksum error
51	Menu error
CArd	Invalid Chipcard
OFF	Chipcard has scale not released
6x	Error in measurement of lenght
–	Notice : Chipcard is saving now

Time base

From the quartz's 4.19MHz a time base is derived which controls all timed processes in the scale. These are, for instance, various timeouts and the on-time.
After expiry of the on-time, the supply voltage for the analog part, for voltage measurement and for the EEPROM is switched off. The LCD is switched off, all ports are set to zero-signal level and the quartz is stopped.

Recalibration

In order to compensate for linear measuring errors of the scale, which can, for instance, occur as a result of the different forces of gravity at different geographical points, the module has a recalibration function. To initiate the function, another button must be pressed when the scale is started. The calibration counter is now displayed which is incremented whenever the scale is recalibrated. It enables the user to check whether the scale was manipulated. If, within five seconds, the button is pressed longer than 1.5 s, the scale switches to recalibration mode. The scale now measures the zero point and waits to be loaded with at least ¼ of the maximum load. By briefly pressing the button the weight displayed can be decremented or incremented in steps of 10g until the weight of the load placed on the scale is reached. The direction can be changed by pressing the button longer. To stop recalibration the button must be pressed longer than 5s. The scale can be switched off any time using the on/off button or by not activating it for a while, thus aborting recalibration.

Optional functions (only DMS low-end module and SLC highend)

The functions "Tare", "Hold", "Autohold" and "Replace weight in repeat measurements" can be implemented via a program on the EEPROM. The functions are explained below:

Tare:
The tare function can be assigned to a button by the EEPROM program. If the button is pressed, the weight is tared off as soon as the display has settled, if it is within the permissible range. Pressing the button again alternatively switches the tare function off or causes the weight to be tared off again.

Hold and Autohold:
If the hold function is assigned to a button by means of the EEPROM, the weight reading is held on display when the button is pressed as soon as the value has stabilized. Alternatively, the hold function can be automated so that the weight will always be frozen when it has exceeded a certain threshold and is stable.
The hold function is switched off after expiry of a predetermined time or by pressing the button again. In addition the scale can be configured so that the hold function will be deactivated when the scale is relieved, when the scale is relieved and then loaded again and / or when the load on the scale changes significantly.

Replace weight in repeat measurements:
The scale can be configured so that the weight last displayed is displayed again in a measurement when the scale detects that it has been loaded with almost the same weight.

Calibration

To ensure that the module functions properly, data must be written to the EEPROM before the module is calibrated. Values that are only determined during the calibration process can be set to 0. The correct figures will then be set after calibration.
If the weight is to be calculated using a third order polynomial, the scale must be calibrated using at least four test loads. In order to increase accuracy, it is recommended to use even more weights.
If you wish to configure individual temperature compensation, the scale must be measured with a load and without a load at temperatures on different ends of the range. In order to determine the square term for slope compensation, the scale must also be measured at an average temperature.
To determine the required calibration values, please refer to the relevant documentation for EEPROM programming.

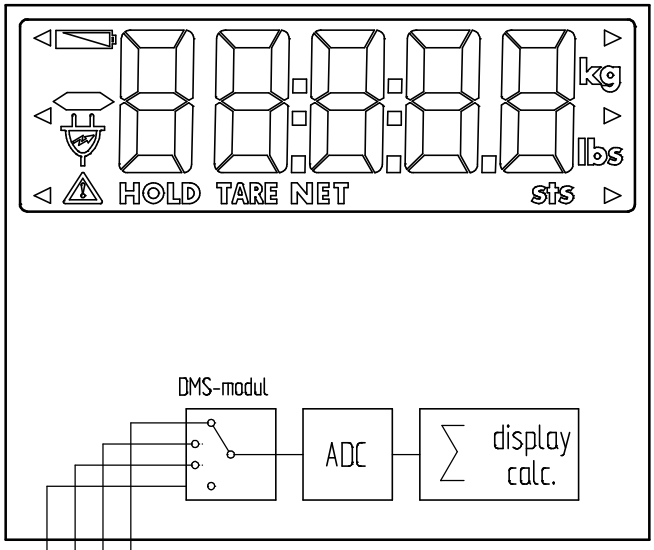
Technical data

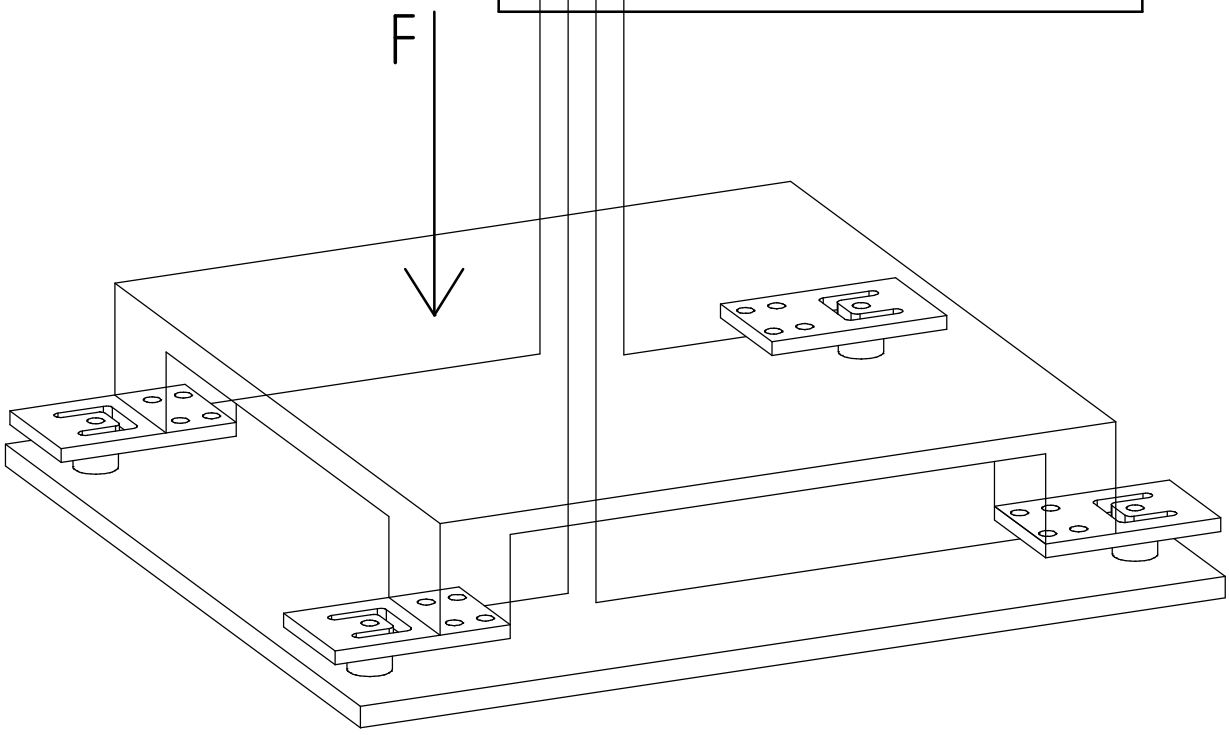
Supply voltage:	Load cell voltage + 0.5 V to 15 V
Supply current:	approximate load cell current
Zero-signal current:	typ. 2µA
Operating temperature:	approx. 0°C to 50°C
Storage temperature:	-10°C to 60°C

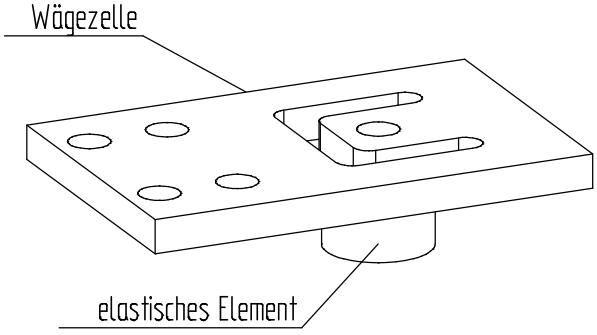
Please refer to the operating instructions to ensure that the scales were operated in the proper manner. In case of a malfunction, the following table will help you to locate the fault.

Description of the fault	Possible cause	Remedy
Scales cannot be started	• Battery is not installed or discharged	• Check the batteries
	• Voltage supply is defective	• Check the voltage at the appropriate connections of the electronics; eliminate the interruption
	• Bus connection cable is defective	• Check the plug-in connections; check the cables for interruption and replace them if necessary.
	• Keypad is defective or not connected	• Check the cable connections; check the cables and the keypad for interruption and replace them if necessary
	• Bus fault	• Disconnect power supply unit and battery from the scale, wait for 60 seconds, then reconnect.
Scales show no weight or an incorrect weight (repeatedly)	• Packaging / transport safeguard has not been fully removed	• Check the scales
	• Scales are maladjusted	• Recalibrate the scales
	• Sensor is damaged	• Replace the sensor and recalibrate the scales
	• Load lever system is damaged or transfer of force to the sensor is interrupted	• Check the base frame (if present, the tie rod) for damage or incorrect assembly
Scale shows only the segment test or the readings are varying to much.	• Shortcircuit between sensor cable and housing	• Search for damaged isolation of the cabel and repair it. (If appropriated use multimeter.)
Incomplete digits	• Display is defective	• Replace the electronics
Malfunction during the weighing procedure	• Display: **Er:x:no**	• The electronics have detected an error. ■ **X**: module number ■ **No:** error number
• **Er:x:10**	• Sensor is defective or not properly connected	• Check and, if necessary, replace the sensor (if the sensor is replaced, a recalibration is required)

Description of the fault	Possible cause	Remedy
• **Er:x:11**	• Sensor is defective or supply lines are damaged	• Check connection cables, check sensor and replace as required (if parts a replaced, a recalibration is necessary) • If several load cell are used, check the allocation (colour codes)
• **Er:x:12**	• Initial load is too high	• Check the initial load • Check the load lever (stuck or bent; check the sensor, replace it if necessary and carry out a recalibration
• **Er:X:14**	• Error during calculation of the kg value	• Incorrect coefficient in the read-only memory of the module; recalibrate the scales
• **Er:x:15**	• Error during recalibration	• Reference weight is outside the permissible range or operator error
• **Er:x:21**	• Error while measuring the battery voltage	• Battery voltage is far too low (< 2.5 V) or electronics are defective -> Replace the electronics
• **Er:x:22**	• Error while measuring the temperature	• Replace the electronics
• **Er:x:32**	• Error: command buffer overflow	• Check the cabling of the bus, eliminate any EMC malfunction, briefly (60 sec.) de-energize the electronics
• **Er:x:40**	• No EEProm data	• Recalibrate the scale or write the correct EEProm data by service program
• **Er:x:41**	• Incorrect EEProm access by the slave	• Check the slave; disconnect or replace the slave
• **Er:x:50**	• Other errors	• Error occurs directly after switching on -> wrong checksum in the ROM -> Replace the electronics
• **Er:x:51**	• Menu error	• Incorrect use of a menu function (wrong data e.g.), try it again







seca	Funktionsschema Functiondiagram mod. 334/335/336	25-01-02-560 a

Description of the calibration mode for scales with modular electronics

General:

Seca scales with modular electronics are fitted with a software-controlled calibration device that is operated using the existing controls. This device can be used to recalibrate the scales or to set the scales to different GAL values. During development of the calibration device, special attention was paid to the following requirements:

- It must be possible to recalibrate the scales without any additional external equipment/tools.
- It must be possible to calibrate the calibration device.
- It must be possible to recalibrate the scales without calibrated test weights.
- The calibration device shall be protected against inadvertent use.

Calibration counter

The scales fitted with the new, modular electronics are equipped with a calibration counter allowing a software recalibration to be carried out according to the requirements for calibrated scales. To carry out such a recalibration, the calibration counter setting can be called up on the display of the scales and compared to the data given on the calibration label mark (applies only for calibrated products). If the values are identical, the scales are calibrated; whereas differing values match the situation of a broken calibration seal. Each completed recalibration procedure is registered by the calibration counter, i.e. the number is automatically incremented by 1.

Recalibrating the scales

Before the scales can be recalibrated, they must be switched to the calibration mode:

To do so, switch on the scales using the appropriate control. While doing so, simultaneously press another control key (for example, the kg/lbs key). This causes the contents of the calibration counter (i.e. the number of calibration procedures carried out so far) to be displayed for five seconds (flashing).
During the 5 seconds the contents is displayed, press the kg/lbs key again and keep it depressed (for more than 1.5 seconds) to switch the scales to the calibration mode.
If the kg/lbs key is not pressed within these 5 seconds, the scales are automatically switched back to normal weighing operation.
When switched to the calibration mode, the scales first are in a decrementing state. This state is indicated by a flashing "dec" that alternates with the currently measured weight.

Now place a test weight onto the scales. This test weight should have a weight of at least 25% of the maximum permissible load for the weight (we recommend a weight of approx. 66-75%). The weight shown on the display must match the test weight; otherwise, the scales are maladjusted and the recalibration procedure must carried out in full length. To do so, change the weight shown on the display using the kg/lbs key until it matches the test weight.
If the value shown on the display differs from the test weight (if not, recalibration is not required), estimate whether the required nominal weight is easier to reach by *decrementing* or by *incrementing*. To toggle from the decrementing mode to the incrementing mode or vice versa, press the kg/lbs key for more than 1.5 seconds (display indicates dec or inc).

Pressing the kg/lbs key for less than 1.5 seconds causes the weight shown on the display to be increased or decreased by 10 g (depending on the mode currently selected). As the resolution of the display is lower, the displayed value will not necessarily be increased or decreased each time the kg/lbs key is pressed. Repeat the above procedure until the displayed weight and the test weight match. Set the scales to the middle between two division values by additionally incrementing or decrementing the value by n=d/(2*10). The calibration process can now be completed by pressing the kg/lbs key for at least five seconds. The scales compute and store a new linearity coefficient and will then be switched off automatically. The scales are now calibrated. Remove the test weight.

Note:
To prevent improper calibration by improper use, a timeout control has been implemented in the calibration mode, i.e. the time that passes until the next key is pressed must never exceed five seconds.

However, this timeout control is only active for the phase when switching to the calibration mode.
If, during this phase, 5 seconds have passed and no key has been pressed, the scales are automatically restored to the weighing mode so that the procedure must be repeated.

To reduce calibration errors to a minimum, recalibration is only possible using a test weight of more than 25% and less than 100% of the max. load; otherwise, “Er:0:15” will appear on the display.

If the scales need to be set to a different GAL value, the displayed value must be matched to the test weight value adapted to the GAL value correction.

Example of a recalibration procedure:

The selected test weight is 100 kg.
The current weight shown on the display is 99.7 kg (max. difference of 300 g).
In this example, you must switch the scales to the incrementing mode to carry out the recalibration procedure. After the kg/lbs key has been pressed (for more than 1.5 seconds), a flashing "inc" is shown.
Now increase the value by the first 10 g (by briefly pressing the kg/lbs key). After this has been done thirty times, the value 100.0 (rounded!) appears on the display although the internal measured value still is 99.95 kg (not rounded!).
To correct this rounding error, increase the value by another 10 g to get exactly 100.00 as the calculated value.
Terminate the recalibration procedure as described above.

Summary of a typical recalibration sequence:

Action carried out by the user	Result
The scales are switched off.	No values or characters on the display.
Press the kg/lbs key and keep it depressed while simultaneously pressing the start key.	The contents of the calibration counter is shown on the display for 5 seconds (flashing).
Release both keys.	The contents of the calibration counter is shown on the display for 5 seconds (flashing).
Press the kg/lbs key for more than 1.5 seconds within the next 5 seconds.	The system switches to the calibration mode: first "dec" appears on the display (flashing) and then the current weight (0.0 - also flashing).
5 seconds have passed and no key has been pressed.	The scales are switched back to normal weighing operation.
Place the test weight onto the scales.	The measured weight of the test weight appears on the display (flashing).
Decide whether to decrement or to increment: <u>Incrementing:</u> Press the kg/lbs key for more than 1.5 seconds. <u>Decrementing</u>: No action required as the scales are already in the dec mode.	 The incrementing mode is activated; "inc" appears on the display. No output on the display.
Decrementing or incrementing: Again briefly press the kg/lbs key (for less than 1.5 seconds).	The measured weight is decreased or increased by 10 g. Please remember that pressing the key does not always change the value on the display due to the low display resolution. Only the rounded value is given.
Repeat this step until the measured weight matches the test weight (format: xx.0 kg).	The display indicates the test weight (format: xx.0 kg).
To correct this rounding error, decrement or increment the value five times by another 10 g.	The display output does not change the first four times.
After the fifth time the value has been decremented or incremented, the measured weight appears; it now matches the test weight.	The display indicates the exact test weight (format: xx.00 kg).
Press the kg/lbs key for at least 5 seconds until the system is switched off.	The display does not show any characters or values any more.

Instructions for PC-based configuration

PC-based configuration is used for diagnosis or recalibration of all seca scales with modular electronics.
The following equipment is required:

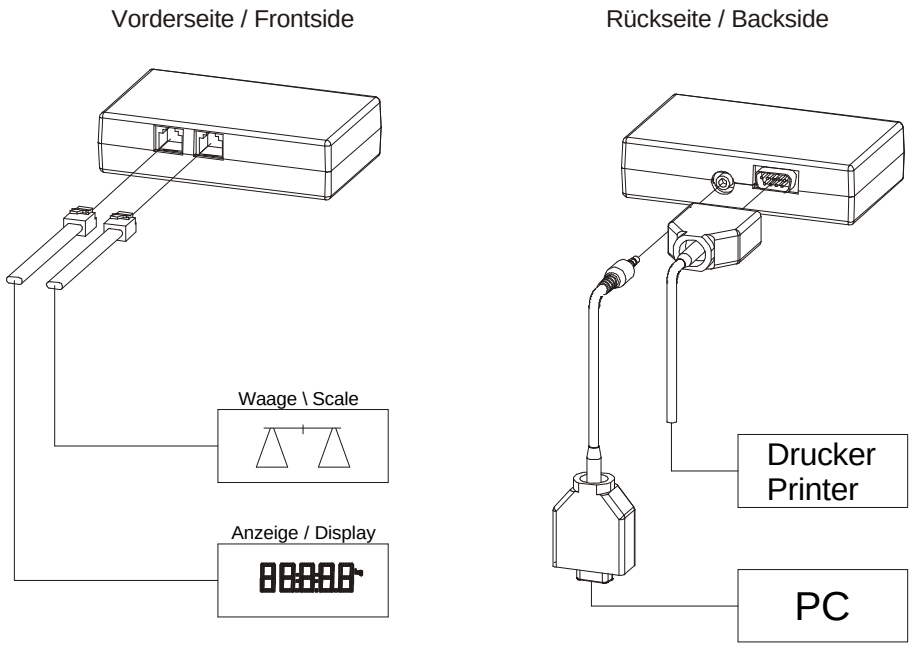
- PC with serial interface (RS -232)
- seca software 'SERVA" 10-02-01-004
- RS232 service set 68-60-00-002,
  consisting of:
  - RS-232-service module 68-60-00-003
  - Connecting cable PC/service module 08-06-16-121
  - Modular cable 08-06-16-115
  - Bus cable for DETF-LEM 08-06-16-125
- Loading weights
  - For scales with DETF sensor at least 5 weight stages up to the MAX
  - For scales with DMS load cell at least 1 weight stage (=MAX)

Software Installation

If your 'SERVA'-software is in a ZIP-file, it has to be unpacked at first.
Execute the program's SETUP.EXE and follow the instructions displayed by the setup program.

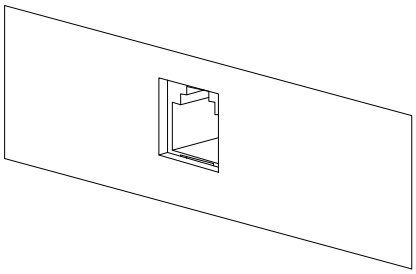
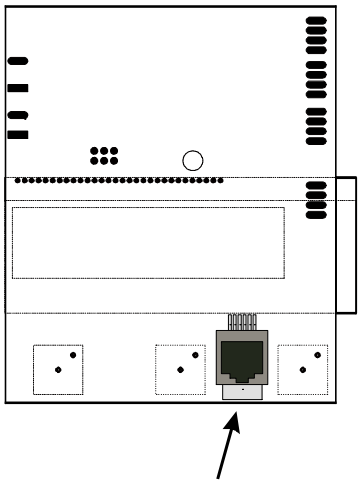
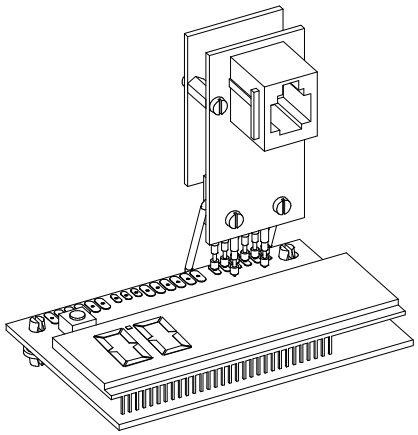
Connecting and calibrating a scale

- If the service module has not been connected to the PC yet, shut the PC down, connect the service module to the serial interface and reboot the PC.



- Switch off the scale!

- For calibration, a connection between the service module and the measured-value acquisition module of the scale to be calibrated must be established. For this purpose, a modular cable must be connected to the scale's SeSAM bus.

Standard case	Connection to the existing display unit port.  The display can instead be connected to the second modular socket of the service module.
DMS module with integrated display 08-06-18-082	 If there is no modular socket on the back of the PCB, retrofit one.
DETF module with integrated display 08-06-18-051 08-06-18-073	Pick off the signal directly from the PCB via the DETF LEM bus cable. 

- Once the cables have been correctly connected, start the scale.
- Start the software 'SERVA' from the programs menu.
- The 'Help'-menu of the 'SERVA'-program contains detailed instructions for available operations

Mod. 374/375/376

Removing the power supply
Before starting any work, unplug the mains plug and remove the batteries!
ESD protection measures must be taken whenever work is performed on electronic components.

1. Opening the scale (page 2)

1.2 Open the battery compartment cover (B) and unscrew the screw (C). Then push the electronics compartment cover (D) slightly to the right and remove it.

1.3 When replacing load cells (WZ) or the mains connection (NB) also:
turn the scale round and place it on a soft mat. Remove the 4 screws (G) and take off the frame (H).

1.4 The adjusting feet (NF) can be unscrewed and replaced by new ones without disassembling the scale.

2.1 Electronic module (EM) (page 2)
After slackening the 7 screws (I), you can take out the PCB. The switching mats (J) and the viewing glass (K) are now accessible. To remove the viewing glass, carefully release the 4 catches along the circumference.
To replace the electronic module (EM), unsolder the cable connections before slackening the screws.

2.2 Load cells (WZ) (Pages 2, 3)
When replacing a load cell (WZ), unsolder the 4 associated litz wires (L) from the electronic module and detach the load cell from the scale by removing the 3 screws (F). It is easier to fit the new load cell if you use the connecting cable of the old load cell to pull in the connecting cable of the new load cell or an auxiliary cable.

2.3 Mains connection (pages 2, 3).
Unsolder the 2 associated litz wires (M) (page 3) from the electronic module (EM) and detach the mains socket (NB) (page 2) from the frame by unscrewing the screws (P).

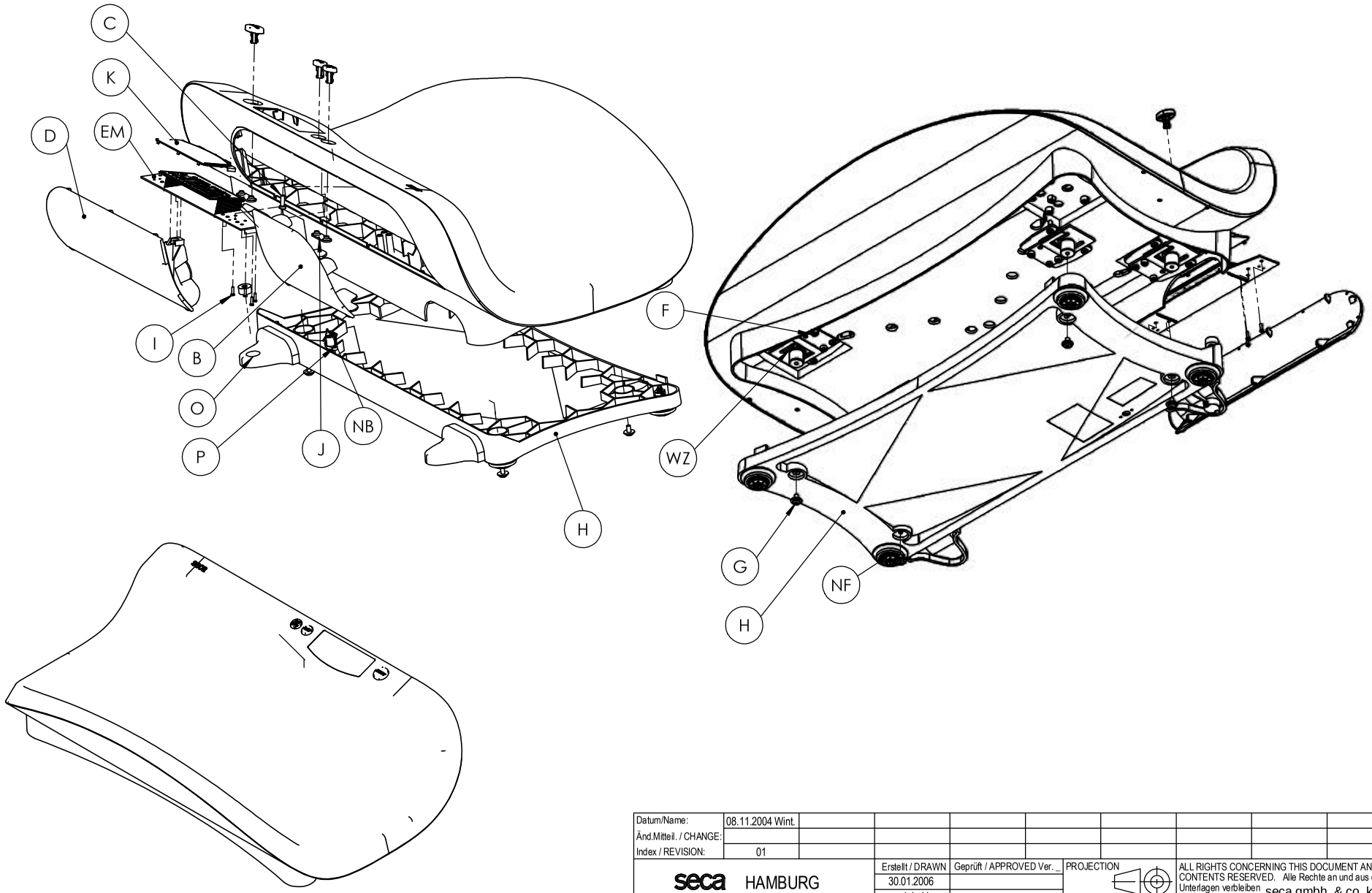
2.4 Bubble level (page 3)
Warning: Only remove the bubble level if it is defective, as destruction of the bubble level cannot be avoided. A new bubble level can only be fitted by a skilled person working with great care!
Lever the bubble level (O) out. Scrape the holder free and clean it.

3. Closing the scale

3.1 Reassemble the scale in reverse order, following steps 2.3 to 1.1.

Important note !
When the electronic module, the load cell or the bubble level are replaced, the scale must be re-adjusted.
Follow instructions no. 30-34-00-603.

3.2 Apply for official calibration of the scale.



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Index / REVISION:	01									

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Maßstab / SCALE :	Werkstoff / MATERIAL :	Benennung / TITLE :	Nr. / NO. :
1:10		Austauschanw. 374/375/376 CN Replacement	30-34-00-726

Blatt/SHEET 2

Dienstag, 21. Februar 2006 12:47:54

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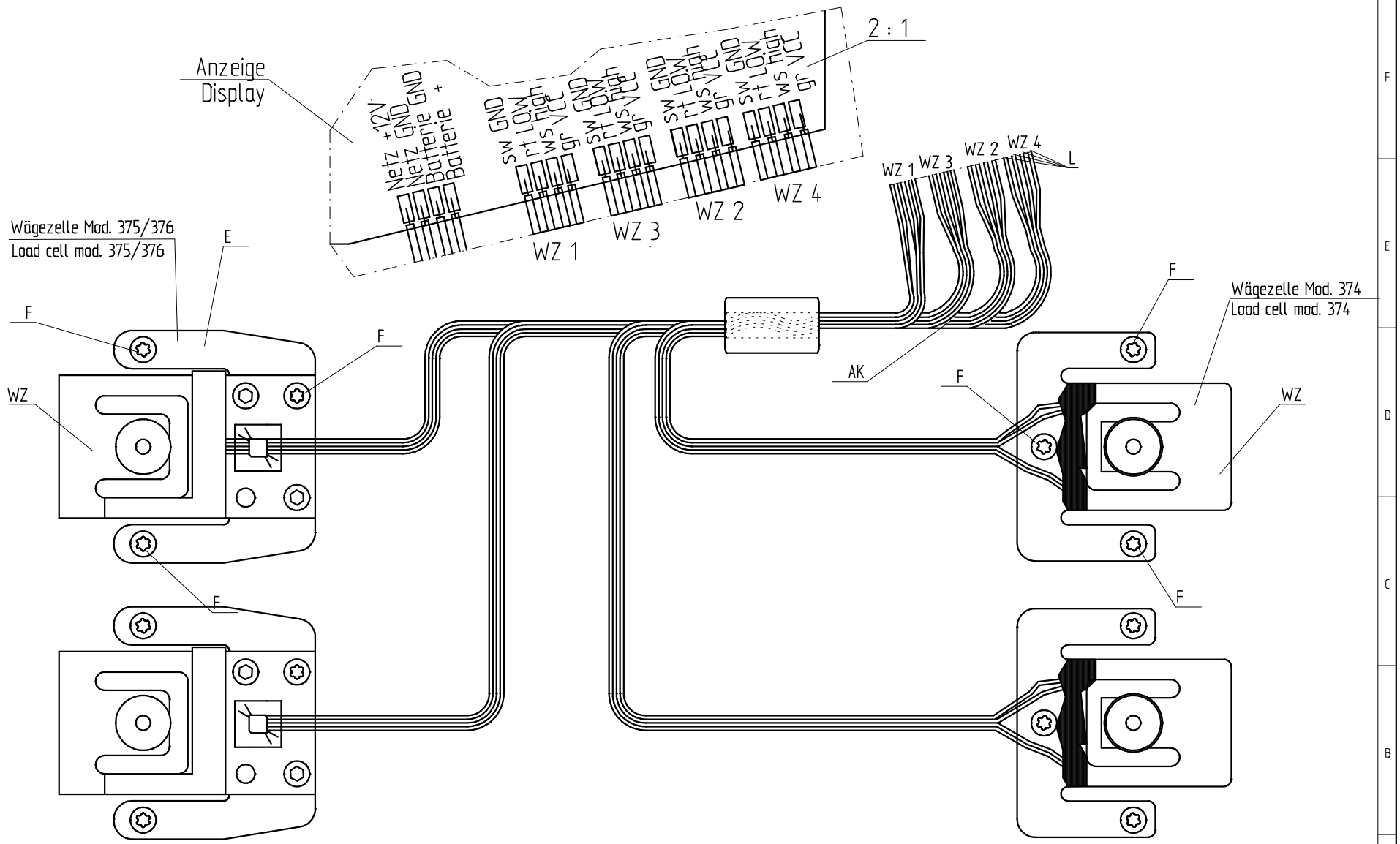

Datum/Name :											
Änd.Mitteil./CHANGE :											
Index / REVISION :											

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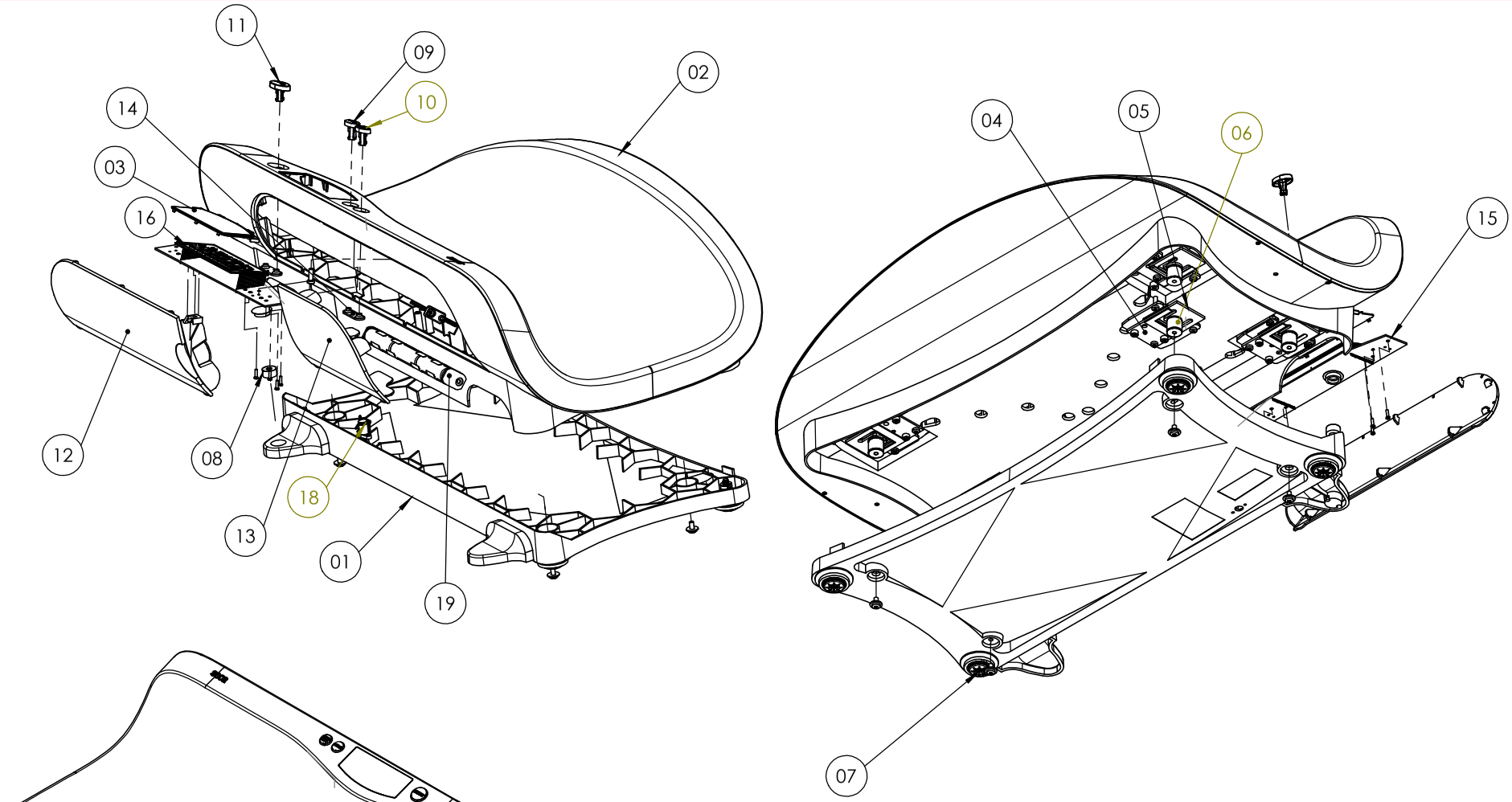
Maßstab/SCALE : 1 : 1	Werkstoff/MATERIAL :	Benennung/TITLE : Austauschanweisung 374 375 376 Replacement 374 375 376	Nr./NO. : 30-34-00-726 Blatt/SHEET 3

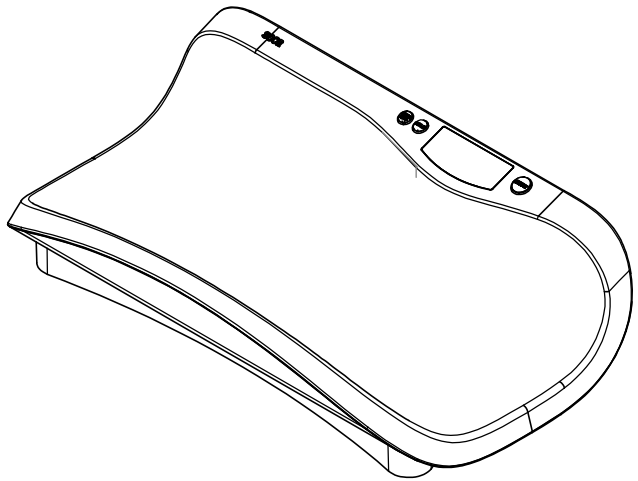
15.02.2006

C:30-34-00-726_03.SZN

seca 374 / 375 / 376

Item.	Articel no.	Designation	Price stage
01	02-01-01-267-009	Frame	30
02	02-03-01-070-509	Mould compl. top, bottom, viewing glas, Push-buttons when order, please clearly indicate the print of puh buttons	40
03	01-22-13-319-009	Viewing glas	15
04	01-03-01-224-009	Support for load cell, mod. 375, 376	15
05	08-06-12-236-009	Load cell, Mod. 375, 376	32
	08-06-12-240-009	Load cell, Mod. 374	25
06	01-13-01-221-009	Rubber element	05
07	01-10-04-222-816	Levelling screw	10
08	01-17-01-204-009	Bubble level 14 mm, mod. 375, 376	15
09	01-18-01-265-201	Button HOLD	05
	01-18-01-265-202	Button HOLD Japan	05
	01-18-01-265-203	Button HOLD China	05
10	01-18-01-266-201	Button NET kg/lbs Mod. 374	05
	01-18-01-266-202	Button NET mod. 375	05
	01-18-01-266-203	Button NET, MB. Mod. 376	05
	01-18-01-266-204	Button NET, MB. Mod. 376, Japan	05
	01-18-01-266-205	Button NET, MB. Mod. 376, China	05
11	01-18-01-267-201	Button START	05
	01-18-01-267-202	Button START, Japan	05
	01-18-01-267-203	Button START, China	05
12	02-03-01-264-009	Top cover electronic	15
13	02-03-01-263-009	Top cover batt. compartment	15
14	65-22-10-215-009	Keypad	10
15	08-06-18-119-009	DMS-small-low end module	42
16	14-05-01-971-009	Sticker for Display technical data Mod.374	01
	14-05-01-971-601	Sticker for Display technical data Mod.374 Russia	01
	14-05-01-971-602	Sticker for Display technical data Mod.375	01
	14-05-01-971-603	Sticker for Display technical data Mod.376 Max. 15kg	01
	14-05-01-971-604	Sticker for Display technical data Mod.376 Max. 20kg	01
17	08-06-16-081-119	Harness Battery connection	15
18	08-06-16-116-119	Harness mains connection	20
19	66-30-60-025-009	Battery holder	10
(20)	14-05-01-868-009	calibration count sticker mod. 375/376	01
	14-05-01-870-009	Foil for calibration count sticker Mod. 375/376	01





Datum/Name:	12.03.2007 Rein.	05.02.2008 Rein.							
Änd.Mitteil. / CHANGE:	Batt_halter hinzu	Sticker ad							
Index / REVISION:	a	b							

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1:10		Ersatzteilliste 374, 375, 376 Spare parts list 374, 375, 376	30-34-00-727 Blatt/SHEET 2

Dienstag, 5. Februar 2008 11:54:22

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